本周工作：

轨迹查询项目：

主要时间花费在撰写文章的 introduction。重写的过程中，从轨迹的查询入手，先说明轨迹查询是基本的任务。但是很多用户的领域不同导致了提出查询条件的不同。

然后说明语义化查询能够是解决上述问题的一种方法。但是现有的都关注于精确的轨迹。难以对不精确的轨迹进行语义赋予。说明区域的功能和时间条件对语义赋予的帮助。

简单提一下查询速率问题（在写）

然后说明语义查询的模糊性，输入可能是模糊的，需要用户不断地改进查询条件，通过探索分析轨迹，得到新的查询条件（在写）

列出贡献点

下周继续写这节，并继续语言润色。

Querying is a common task when analyzing massive trajectory data. To do this, data analysts present their requirements by inputting query conditions and obtain a group of filtered trajectories that meet the requirements. Such query mechanism has proven to be useful for filtering data which can be applied to make improvement in peoples life quality, urban environment, and city operation systems. However, the task becomes complex when analysts are from different domains and propose different query requirements. Many research worked on helping the analysts present their query requirements [10]. Using textual sentence is one of the most natural ways to express complicated query conditions and can be further applied over annotated trajectory data to filter the massive trajectories. By externalizing the geospatial locations with inherent contextual information (a.k.a., textualization), annotating trajectory data provides knowledge-based context information [45] which dramatically enriches the raw data [2,20,38,50]. In a textual sentence, the analysts use location names (e.g., Golden Gate Bridge), functions categories (e.g., Education areas, residential areas) and directions to demonstrate the spatial constraints.

Despite the "textualization-and-query" scheme has been applied in several visual analytics systems including studying taxi trajectories [1, 11] and human mobility patterns [53], most existing methods assume the input trajectories with accurate geo-location. A trajectory with inaccurate geo-location can be represented by a series of chronologically ordered sampling points. Each point only tells us a spatial region that the moving object may be located in, but not the accurate longitude and latitude. Annotating such inaccurate trajectory faces a challenge on assigning a sampling point to one

fixed nominal value of context (e.g., a street or POI name). For example, if a trajectory enters a region which contains a restaurant and a company, then either the restaurant or the company is likely to be the destination (potential context) of that trajectory. Although it is difficult to confirm a unique destination in an inaccurate trajectory, integrating high-level description of regions (e.g., functions) and temporal attributes into the textualization process can help to reason it. For example, people are more likely to go to a restaurant during the lurch time than a school, or more likely to go shopping in a mall than work in a company during the weekend in an entertainment area. Recently, we have witnessed the success of many approaches to extract the high-level description of regions [13, 33, 43, 46]. Yuan et al. [50] discover the regions' functions by using a topic-based inference model on Points of interests (POI) data. We extend their topic-based method and propose a novel textualization process. In the process, we take descriptive information and temporal attributes into account to achieve a reasonable trajectory annotating method.

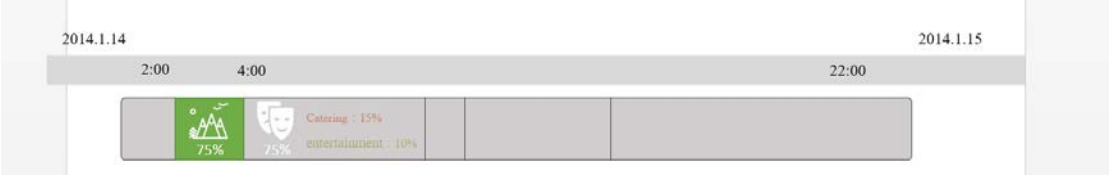
The issue of inputting query condition becomes even more difficult when the analysts don't have a clearly retrieved goal. For example, when a manager of a university wants to analyze the daily life of students, it is hard to express what is the 'daily life'. The analysts only have some fuzzy words to describe their query requirements (e.g., student and university). As "Data exploration is about efficiently extracting knowledge from data even if we do not know exactly what we are looking for." [22], visual analysis plays an important role in finding something interesting and generating new questions [24]. Despite the existing methods dedicated to enabling fuzzy query and building interactive environment for examining the trajectories data, two aspects remain underexplored. The first is relevance quantification when the analysts specify a fuzzy input. [zhaosong is here] Similarly, the analysts need to fully understand the semantics of trajectories. Thus, we should present a efficient and intuitive visual representation to support illustration, and interpretation of massive mobile trajectories.

One other issue is how to speed up the query. With a large volume of data (e.g., 14 million citizens' trajectories of multiple months with more than 100 GB), A real-time visual analytic system demands efficient indexing mechanism.

[should pipeline and quantification method be separated?] To sum up, our contributions are as follows:

- We introduce A "textualization-and-analysis" pipeline to support efficient text-based query, and relevance quantification between trajectories and user defined query condition.
- We present a multi-faceted visual interface and interaction designs for specifying the query condition, visual depiction and exploration of the massive trajectory.
- we propose two use scenarios based on a real-world human mobile trajectory dataset in a mid-size city of China to demonstrate the efficacy of our approach.

项目工程上：
合并项目，砍掉之前的多轨迹集合展示（效果不好）。结合之前的单轨迹展示，改成方形（俞在改），然后结合到时间轴上，也用于列表中，新的设计比较适合并列展示（类似下图）。NLP 部分胜杰在训练分词。然后把新的项目的后端跑通。俞负责把之前的轨迹热力快速展示和选择接上。这样前端就有轨迹在 map 空间的展示了。



以下是工程列表

项目	小任务	本周	现状
语义项目	NLP		完成分词，正在找匹配算法
	语料库	加入 POI 分词训练中	计划：二分图最大匹配计算距离
	相似性度量		
	交互方法	热力图选择交互	
	项目合并（俞，高做的前后端合并）	完成	
轨迹分类器	轨迹分类器	没来的同学完成了多个轨迹聚类方法。下周将实验出租车轨迹，人的轨迹效果一般，因为她没很多数据	
	抽象空间轨迹		要做二维的多坐标轴空间，力引导布局，每个顶点是一个功能区。（雷达图）
LMI	生成不同的图片		
流场项目（大屏）	离线数据		

论文阅读：
《DQNViz: A Visual Analytics Approach to Understand Deep Q-Networks》
利用可视分析来解决深度 Q 网络的理解，纠错，和改进问题。文章首先深入分析了网络的几个阶段。然后用一个游戏当做例子，介绍了每个阶段存在的，理解，展示，纠错等问题。最后一一对这些问题设计系统。有理有据。文章比较长，但是介绍的很清楚。游戏也比较简单。

Towards Better Spatial Integration in Ranking Visualization

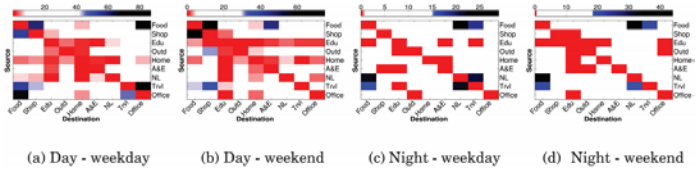
通过经纬度上的统计，属性值的统计，投影上的选择，联动的过滤地理空间多维数据，并对多位数据进行数据排序，查看密度等操作。系统简单明了。

写文章读的几篇抽取区域语义文章，1 是再读

Discovering Regions of Different Functions in a City Using Human Mobility and POIs 再读，利用轨迹和 POI 抽取。

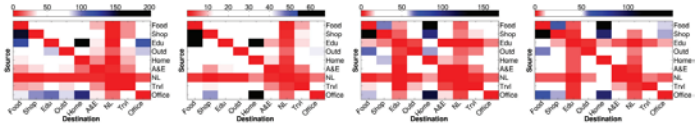
Revealing the City That We Cannot See

OD 数据反应的城市的流动模式。抽取功能后的城市流动可视化如下。



(a) Day - weekday (b) Day - weekend (c) Night - weekday (d) Night - weekend

Fig. 11. The image of London for different periods.



(a) Day - weekday (b) Day - weekend (c) Night - weekday (d) Night - weekend